

APPENDIX 2: BULL TROUT PROTECTION AND RECOVERY GUIDANCE FOR FEDERAL LANDS

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Introduction:

A large proportion of bull trout core habitats in recovery units occur on lands managed by the Federal government, including the Forest Service and Bureau of Land Management. Federal land management actions will have great opportunity and carry much of the responsibility to protect and recover bull trout. The listing rules (63 FR 13647; 64 FR 17110; 64 FR 58910) identified threats from past and existing Federal land management. These recommendations address those threats. Federal land managers should apply these recommendations where Federal lands overlap with recovery units in addition to existing or interim plans to alleviate threats and restore bull trout habitat on Federal lands.

These recommendations acknowledge the substantial contributions that the Forest Service and the Bureau of Land Management will need to make, and recognize their conservation advancements of the last several years. This recognition is apparent by the incorporation of Forest Service and Bureau of Land Management management direction of the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl Standards and Guidelines for Management of Late-Successional and Old-Growth Forests Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan), Interim Strategy for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH) and the Interim Strategy for Managing (resident) Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada (INFISH) into these recommendations for bull trout conservation on Federal lands.

Please note, some Forest Service and Bureau of Land Management administrative units have existing management direction that may be more protective than some of these recommendations. Such protective measures may have resulted from actions implemented to benefit other threatened, endangered or sensitive species, such as northern spotted owl, salmon, and grizzly bear, or specific standards for aquatic habitat management. These recommendations do not supercede existing management direction where it is more protective, such as in proposed Wilderness or Wild and Scenic River designations. In addition, Northwest Forest Plan, PACFISH, and INFISH direction provide management protection

similar to these recommendations. These recommendations do not conflict with Northwest Forest Plan, INFISH, or PACFISH direction or the U.S. Fish and Wildlife Service's biological opinions regarding those plans and should be used to supplement Forest Service and Bureau of Land Management plans and our past biological opinions on these plans.

As part of the U.S. Fish and Wildlife Service's role in recovering bull trout, we will apply these recommendations during section 7 consultations with the Forest Service, Bureau of Land Management, and other Federal agencies to help design future actions consistent with bull trout recovery needs and as a standard for comparison of individual or groups of actions within watersheds.

Management Approach to Bull Trout Conservation on Federal Lands:

We recommend that Federal agencies follow these five components, listed and then described in detail below, when planning, designing, and implementing management actions within bull trout recovery units. Federal land management agencies should also consider these five components when analyzing potential effects of their plans or actions on bull trout.

1. Support recovery plan goals and objectives to maintain and restore bull trout habitats as described in the recovery plan and recovery unit chapters by implementing recovery tasks.
2. Identify and protect bull trout habitat protection zones.
3. Follow project designs for bull trout conservation.
4. Conduct watershed analysis and subbasin analysis and use results to design management plans and actions compatible with bull trout protection and recovery.
5. Use implementation and effectiveness monitoring to determine if:
 - a) actions on federally managed lands implemented recovery tasks or followed the Project Designs for Bull Trout Conservation; and
 - b) recovery tasks or Project Designs for Bull Trout Conservation successfully protect and contribute to the recovery of bull trout.

Below, each of the five components of the Management Approach is described in detail.

1. Support recovery plan goals and objectives to maintain and restore bull trout habitats as described in the recovery plan and recovery unit chapters by implementing recovery tasks.

The recovery plan identifies a single goal and four objectives (both programmatically and for individual recovery units), and describes general and specific tasks in the recovery unit chapters. Federal land managers should examine these and other parts of the recovery plan to determine how the information applies in their management unit(s), and to assure proposed actions are consistent and compatible with the tasks identified for particular areas. Especially where recovery unit chapters are not yet available, Federal lands should be managed according to the Interagency Implementation Team Interim Watershed Restoration Strategy (USDA *et al.* 2000a) and the Bull Trout Interim Guidance (USFWS 1998c), as appropriate. In general, management should maintain or improve the following conditions adapted from established aquatic conservation strategies in PACFISH, INFISH, and the Northwest Forest Plan:

- (A) water quality to provide stable and productive riparian and aquatic ecosystems;
- (B) stream channel integrity, channel processes, and the sediment regime (including the elements of timing, volume, and character of sediment input and transport) under which the riparian and aquatic ecosystems evolved;
- (C) instream flows sufficient to restore riparian and aquatic habitats necessary for effective functions of stream channels, including discharge of flood waters;
- (D) natural timing and variability of the water table elevation in meadows and wetlands;
- (E) diversity and productivity of plant communities in riparian zones;

- (F) riparian vegetation adequate to:
 - (1) provide a natural range of levels and distributions of large woody debris in streams and riparian areas;
 - (2) provide natural thermal regulation in riparian and aquatic habitats during summer and winter; and
 - (3) restore rates of surface erosion, bank erosion, and channel migration characteristic of those under which the communities evolved.
- (G) riparian and aquatic habitats necessary to foster the unique genetic fish stocks that evolved within the specific physiographic setting; and
- (H) connected habitats to support populations of well-distributed native and desired non-native plant, vertebrate, and invertebrate populations that contribute to the viability of riparian-dependent communities and protection and recovery of bull trout.

The specific, measurable habitat conditions or variables where bull trout thrive are described in the Interim Guidance (USFWS 1998c) as "biological needs" related to temperature, habitat complexity, connectivity, and substrate composition and stability, and that terminology is used here. For complete discussion of the terminology, please refer to Chapter 1 of the recovery plan and the Interim Guidance.

2. Identify and Protect Bull Trout Habitat Protection Zones

To protect and recover bull trout, lands with the most influence on streams must be managed primarily for bull trout and the riparian-dependent resources that bull trout depend upon. Management activities should use Project Designs for Bull Trout Conservation to protect these areas. For this document, we will call the areas with the most influence on streams "bull trout habitat protection zones."

Habitat protection zones have two main components:

- 2. A) Riparian-associated habitat protection zones that consist of riparian corridors, wetlands, intermittent streams, and other areas that help maintain the integrity of aquatic ecosystems by:
 - (1) influencing the delivery of coarse sediment, organic matter, and woody debris to streams;

- (2) providing root strength for channel stability;
 - (3) providing thermal insulation in all seasons to streams; and
 - (4) protecting water quality (Naiman 1992); and
2. B) Roadless and low-density roaded habitat protection zones important for bull trout identified in the Road Density Analysis Task Team Report (USDA *et al.* 2000a).

In this document, habitat protection zones will be used to refer to both the riparian and roadless and low density roaded area habitat protection zones. Specific definitions for locating habitat protection zones on the landscape are described below.

Riparian associated habitat protection zones: Generally, the widths of riparian habitat protection zones that are adequate to protect streams from non-channelized sediment inputs should be sufficient to provide other riparian functions, including delivery of organic matter and woody debris, stream shading, and bank stability (Brazier and Brown 1973; Steinblums *et al.* 1984; Beschta *et al.* 1987; McDade *et al.* 1990; Sedell and Beschta 1991; Henjum *et al.* 1994; Belt *et al.* 1992). The effectiveness of riparian conservation areas in influencing sediment delivery from non-channelized flow is highly variable. One review of available scientific literature concluded that non-channelized sediment flow rarely travels more than 300 feet and that 200 to 300 foot riparian "filter strips" are generally effective at protecting streams from sediment from non-channelized flow (Belt *et al.* 1992). The riparian associated areas of habitat protection zones are very similar to the protected riparian areas in the Idaho Conservation Strategy (IDFG 1995). The references in this paragraph are the basis of the riparian habitat protection zones description below.

Riparian habitat protection zone widths should be applied where watershed analyses have not been completed, and wherever watershed analysis corroborates these recommended widths. Where watershed analysis indicates the riparian habitat protection zone width should be greater than those described here, those values should be applied. Watershed analysis information would be necessary to provide scientific rationale to justify modifications that would decrease riparian habitat protection zones within a specific area of a watershed.

The recommended description and measurements of riparian habitat protection zones fall into three categories of stream or water bodies as similarly described in the PACFISH, INFISH, and Northwest Forest Plan.

Perennial or historically perennial streams: Riparian habitat protection zones consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet, including both sides of the stream channel), whichever is greater.

Ponds, lakes, reservoirs, and wetlands greater than 1 acre: Riparian habitat protection zones consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of the seasonally saturated soil, or to the extent of moderately and highly unstable areas, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance from the edge of the maximum pool elevation of constructed ponds and reservoirs, or from the edge of the wetland, pond or lake, whichever is greater.

Seasonally flowing or intermittent streams, wetlands less than 1 acre, landslides, and landslide-prone areas: This category includes features with high variability in size and site-specific characteristics. At a minimum, the riparian habitat protection zones must include:

1. the extent of landslides and landslide-prone areas;
2. the intermittent stream channel and the area to the top of the inner gorge;
3. the intermittent stream channel or wetland and the area to the outer edges of the riparian vegetation;
4. the area from the edges of the stream channel, wetland, landslide, or landslide-prone area to a distance equal to the height of one site-potential tree, or 150 feet slope distance, whichever is greater;

In non-forested rangeland ecosystems, the riparian habitat protection zones width for permanently flowing streams is the extent of the 100-year flood plain.

Roadless and low-density roaded habitat protection zones: The roadless and low-density roaded area portions of habitat protection zones were developed by an interagency group (including the Forest Service, Bureau of Land Management, the National Marine Fisheries Service, and the U.S. Fish and Wildlife Service) addressing Federal lands within the Klamath River and Columbia River Distinct Population

Segments. Maps and lists of important roadless and low-density roaded area habitat protection zones are found in the Road Density Analysis Task Team Report (USDA *et al.* 2000a) for the Klamath River and Columbia River distinct population segments, but not for the other distinct population segments. Because the Klamath River and Columbia River distinct population segments maps were developed at the broad scale of two distinct population segments ranging across five States, a watershed analysis would not be sufficient to analyze the distinct population segment-wide issues associated with this set of roadless areas important for bull trout. Accordingly, the roadless and low-density roaded portions of the habitat protection zones should not be subject to change until an interagency team, including the U.S. Fish and Wildlife Service, conducts a basin-wide assessment to determine which, if any, roadless and low-density roaded area portions of habitat protection zones should be modified.

3. Project Designs for Bull Trout Conservation

To protect and recover bull trout, Federal land managers should apply Project Designs for Bull Trout Conservation within all habitat protection zones and to projects and activities that would degrade conditions in habitat protection zones. Some Project Designs for Bull Trout Conservation apply both inside and outside of habitat protection zones, as specified in each Project Designs for Bull Trout Conservation. The Project Designs for Bull Trout Conservation address 10 management issues in habitat protection zones and associated areas: timber extraction, roads management, grazing management, recreation management, mineral mining management, fire and fuels management, lands, general riparian area management, watershed and habitat restoration, and fisheries and wildlife restoration. These issues and project design features are similar to PACFISH, INFISH, and the Northwest Forest Plan and associated biological opinions, and thus should be relatively easy to interpret and implement.

Timber Extraction:

1. Prohibit timber extraction, including fuel wood cutting, in habitat protection zones, except as described below.
 - a. Apply silvicultural practices within habitat protection zones only to acquire desired vegetation characteristics where needed to attain bull trout biological needs. Allow timber extraction, including fuel wood cutting, in habitat protection zones only where present and future woody debris needs are met, where cutting would not retard or prevent attainment of other biological needs, and where adverse effects on bull trout can be fully avoided.

b. Complete watershed analysis prior to timber extraction, including fuel wood collection, in habitat protection zones. Extract timber and apply silvicultural practices only if watershed analysis identifies a method that would not retard attainment of bull trout biological needs and that would fully avoid adverse effects on bull trout and impacts on their habitat, either occupied or unoccupied.

2. Analyze and address the cumulative, landscape-level effects of past and proposed timber extraction in the context of the natural and human-induced disturbances at various scales, including the subbasin, watershed, and subwatershed. Assure that as a result of proposed management, frequency, magnitude, duration of peak flows, and other disturbances to aquatic habitat do not result in adverse effects on bull trout or core habitat.

As discussed in the recovery plan, removal of live trees and associated road construction causes hydrologic and erosional changes that include alteration of the timing, volume, and duration of peak flows and transport of sediment as bedload. The amount and types of changes tree removal and road construction may cause depend upon climate, and the location and size of these actions in relation to streams, draws, and other topographic, soil, and geological features of an area. Because these features vary, any potential for hydrologic changes following proposed timber harvest and road construction should be analyzed using locally adapted models selected by level 1 teams (formed under the interagency Guidance for Streamlining Consultation Procedures Under Section 7 of the Endangered Species Act; USDA *et al.* 1997a) and applied at local analysis levels (subbasin, watershed, and project) as part of the section 7 consultation process. We are aware of several cumulative effects analysis procedures and models (*e.g.*, Potts *et al.* 1989; Nakama and Risley 1993; and many reviewed in Reid 1993), but are also aware that none are widely accepted and used. To understand and predict the effects from existing and planned timber extraction, the U.S. Fish and Wildlife Service recommends that land managers apply models adapted to or developed for site-specific conditions. In the absence of locally-adapted models, apply the method below to start addressing an index of cumulative effects in section 7 consultation:

A. Using methods accepted for the area, calculate the equivalent clear-cut acreage for each subbasin, watershed, and subwatershed within which timber extraction is proposed.

B. Compare the calculated equivalent clear-cut acreage values for watersheds and subwatersheds to the appropriate values in the table below. If the proposed timber extraction would increase the equivalent clear-cut acreage above any of the applicable values listed below, then proceed only with part of the action that will achieve an equivalent clear-cut acreage less than the value(s) in the table.

If analysis determines, as affirmed by level 1 teams, that bull trout habitat is maintained at an equivalent clear-cut acreage value different than from the table, then use that value whether it is higher or lower than the value in the table.

C. Use the results of these basic calculations along with other aspects of bull trout recovery needs to prioritize local evaluations and recovery actions relating to cumulative effects from timber harvest and associated roads.

We understand that this approach to addressing cumulative effects is not the most sophisticated available. However, this appendix addresses the entire United States range of bull trout, including places where sophisticated, locally-developed models do not exist. We used a simple, unified approach as a first step toward addressing a cumulative effects index for timber extraction during section 7 consultation. In addition, we are fully aware that negative direct and indirect effects from various mechanisms can result from timber extraction at levels well below the equivalent clear-cut acreage values indicated in the table. Those direct and indirect effects will be fully considered in other analysis procedures during section 7 consultation, although they may not be apparent in this basic cumulative effects index.

We will generally rely on this basic index as an indicator of where the effects of proposed actions, together with cumulative effects, may be incompatible with bull trout recovery, unless other models with full level 1 team support exist.

Roads Management

1. Cooperate with Federal, Tribal, State, and county agencies, and cost-share partners to achieve consistency in road use and maintenance necessary to attain bull trout biological needs.
2. For each existing road, meet the bull trout biological needs and avoid adverse effects on bull trout by:
 - A. Developing and implementing an Existing Road and Transportation Management Plan. Address these items in the plan:
 - i. Road management objectives for each existing road.
 - ii. Criteria that govern road operation, maintenance, and management.
 - iii. Requirements for pre-, during-, and post-storm inspections and maintenance.
 - iv. Regulation of traffic during wet periods to minimize erosion and sediment delivery and accomplish other objectives.

- v. Implementation and effectiveness monitoring plans for road stability, drainage, and erosion control.
- vi. Emergency repair plans for road failures.

B. Avoiding sediment delivery to streams from existing road surfaces.

- i. During maintenance grading or resurfacing, outslope the roadway surface except in cases where outslipping would increase sediment delivery to streams or where outslipping is infeasible or unsafe.
- ii. Route road drainage away from potentially unstable stream channels, fills, and hillslopes.

C. Avoid disruption of natural hydrologic flow paths including overland, subsurface, and groundwater.

D. Avoid sidecasting snow. Prohibit sidecasting of road material on road segments within or abutting habitat protection zones in all bull trout recovery units.

3. Determine the influence of each existing road on bull trout biological needs. Meet bull trout biological needs and avoid adverse effects on bull trout by:

A. Reconstructing road and drainage features that do not meet design criteria or operation and maintenance standards, or that have been shown to be less effective than designed for controlling sediment delivery, or that retard attainment of bull trout

biological needs, or do not protect bull trout from sedimentation elevated above levels where bull trout biological needs can be achieved.

B. Close and stabilize or obliterate and stabilize roads not needed for future management activities. Prioritize these actions based on the current and potential damage to bull trout habitat and the ecological value of the riparian resources affected.

4. Improve existing and new culverts, bridges, and other stream crossings to accommodate a 100-year flood, including associated bedload and debris. Base priority for upgrading on risks to bull trout and the ecological value of the riparian resources affected. Construct and maintain crossings to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

5. Provide and maintain bull trout passage at all road crossings of existing and potential fish-bearing streams. Where passage is blocked and may be preventing brook trout from invading bull trout habitat, consider the potential effects of brook trout introduction prior to removing passage barriers that separate bull trout from brook trout.
6. In areas outside roadless and low-density roaded area habitat protection zones, reconstruct roads or construct new roads within riparian habitat protection zones only if all three of these conditions are met:
 - A. If at least two times the road area (road length times road width, including cutbank and sidecast) constructed is obliterated concurrently or prior to the construction;
 - B. If watershed analysis, other scientifically sound site-specific analysis, and section 7 consultation at the watershed-scale predict the net effect of construction and obliteration would appreciably reduce long-term sedimentation or other adverse effects of roads; and
 - C. Bull trout local populations can withstand the short-term effects and are predicted to respond to the long-term habitat improvements.
7. Do not construct or reconstruct roads in roadless and low-density roaded area habitat protection zones identified in the Road Density Analysis Task Team Report (USDA *et al.* 2000d).
 - A. The effects of roads on bull trout habitat is well documented. Roadless and low-density roaded areas constitute watersheds or portions of watersheds unaltered by the effects of roads. Roadless and low-density roadless habitat protection zones can provide stability to anchor recovery efforts within larger areas. The stability of roadless and low-density roaded habitat protection zones should not be jeopardized by introducing the negative effects of roads.
 - B. As discussed in the recovery plan, the recovery team has reviewed the literature on the effects of fires and the effects of roads. In general, the effects of all types of fires on Federal lands, including stand-replacing fires in areas where stand-replacing fires historically did not occur, generally pose less risk to bull trout than the long-term, chronic effects of roads on Federal lands. For that reason, construction of roads to prevent fires is not a valid approach to conservation of bull trout and their habitats on Federal lands.

8. Determine the road density on a linear mile per square mile basis (mile/mile²) for all roaded areas in a watershed. Lee *et al.* (1997) indicate that most strong bull trout populations occur where road densities are 0.45 mile/mile² or less.

A. Where road densities exceed 0.45 mile/mile², transportation management plans should identify and implement strategies to reduce road density. Implement restoration actions to reduce road densities such that roads, road segments, or other road-related features (*i.e.*, culverts or crossings) that pose the highest risks to bull trout habitat are addressed first. Prioritize and identify road risks through application of Roads Analysis. Appropriate road density targets and specific road obliteration actions should be developed as part of peer reviewed watershed analysis.

In addition, do not build additional roads in areas or watersheds where road density is greater than 0.45 mile/mile² unless:

- i. Watershed analysis has determined that increased road density will not adversely affect bull trout or their biological needs, even in presently unoccupied habitat, or
- ii. Construction is preceded by or concurrent with an equal or greater length of road obliteration elsewhere in the watershed or subwatershed and is consistent with the road density reduction plan.

B. For roaded areas with road densities less than 0.45 mile/mile², create and implement a plan to assure road densities do not approach or exceed 0.45 mile/mile² or another value determined to be appropriate by the peer reviewed watershed analysis for the watershed.

Grazing Management

1. Modify grazing practices (*e.g.*, accessibility of riparian areas to livestock, length of grazing season, stocking levels, timing of grazing, etc.) that retard or prevent attainment of bull trout biological needs or are likely to adversely affect bull trout. Suspend grazing if adjusting practices is not effective in meeting bull trout biological needs and avoiding adverse effects on bull trout.

2. Locate new livestock handling and management facilities outside of riparian habitat protection zones. For existing livestock handling facilities inside the riparian habitat protection zones, assure that facilities do not prevent attainment of bull trout biological

needs or adversely affect bull trout. Relocate or close facilities where these objectives cannot be met.

3. Limit livestock trailing, bedding, watering, salting, loading, and other handling efforts to those areas and times that will not retard or prevent attainment of bull trout biological needs or adversely affect bull trout.
4. Adjust wild horse and burro management to avoid negative effects that prevent attainment of bull trout biological needs or adversely affect bull trout.
5. Include riparian habitat protection zones in a separate pasture with separate management objectives and strategies than the rest of the allotment.
6. Fence or herd livestock out of riparian areas for as long as necessary to allow vegetation and stream banks to recover.
7. Control the timing of grazing to: (a) keep livestock off stream banks when they are most vulnerable to damage; and (b) coincide with the physiological needs of target plant species.
8. Add more rest to the grazing cycle to increase plant vigor, allow stream banks to heal, or encourage more desirable plant species composition.
9. Limit grazing intensity to a level that will maintain desired species composition and vigor.
10. Permanently exclude livestock from riparian habitat protection zones or streambank areas at high risk and with poor recovery potential when there is no practical way to protect them while grazing adjacent uplands.
11. Implement changes consistent with monitoring results. Monitor consistent with the Range Resource Implementation Monitoring Module and Effectiveness Monitoring Modules (USDA and USDI 1998; USDA *et al.* 1999 a,b,c,d).

Recreation Management

1. Design, construct, and operate recreation facilities, including trails and dispersed sites, in a manner that does not retard or prevent attainment of bull trout biological needs and avoids adverse effects on bull trout.
 - A. Construct new recreation facilities in habitat protection zones only if watershed analysis, other scientifically sound site-specific analysis, and section

7 consultation at the watershed-scale unequivocally predict the long-term effects are fully compatible with bull trout protection and recovery; and

B. For existing recreation facilities inside habitat protection zones, assure that the facilities or use of the facilities will not prevent attainment of bull trout biological needs

or adversely affect bull trout. Relocate or close existing recreation facilities where bull trout biological needs cannot be met or adverse effects on bull trout cannot be avoided.

2. Adjust dispersed and developed recreation practices that retard or prevent attainment of bull trout biological needs or adversely affect bull trout. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and specific site closures are not effective in meeting bull trout biological needs and avoiding adverse effects on bull trout, eliminate the practice or occupancy.

3. Achieve attainment of bull trout biological needs and potential effects on bull trout in Wild and Scenic Rivers, Wilderness, and other Recreation Management plans.

Mineral Mining Management

1. Avoid adverse effects to bull trout habitat from mineral mining operations. If a mineral operation is located in a habitat protection zones, or could affect attainment of bull trout biological needs, or adversely affect bull trout, require a reclamation plan, approved plan of operations (or other such governing document), and reclamation bond. For effects that cannot be avoided, such plans and bonds must address the costs of removing facilities, equipment, and materials; recontouring disturbed land to near pre-mining topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvage and replacement of topsoil; and seed bed preparation and revegetation to attain bull trout biological needs and avoid adverse effects on bull trout. Ensure reclamation plans contain measurable attainment and bond release criteria for each reclamation activity.

2. Locate structures, support facilities, and roads outside habitat protection zones. Where no alternative to situating facilities in habitat protection zones exists, locate and construct the facilities in ways that avoid negative effects to habitat protection zones and streams and adverse effects on bull trout.

- A. Where no alternative to road construction exists keep roads to the minimum necessary for the approved mineral activity and obliterate two times the road area constructed.
 - B. Close, obliterate, and revegetate roads no longer required for mineral or land management activities.
3. Prohibit solid and sanitary waste facilities in habitat protection zones. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in habitat protection zones exists, and releases can be prevented and stability can be ensured, then:
- A. Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.
 - B. Locate and design the waste facilities using the best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in habitat protection zones.
 - C. Monitor waste and waste facilities to confirm predictions of chemical and physical stability, and make adjustments to operations as needed to avoid adverse effects to bull trout and to attain bull trout biological needs.
 - D. Reclaim and monitor waste facilities to assure chemical and physical stability and revegetate to avoid adverse effects on bull trout and to attain bull trout biological needs.
 - E. Require reclamation bonds adequate to ensure long-term chemical or physical stability and successful revegetation of mine waste facilities.
4. For leasable minerals, prohibit surface occupancy within habitat protection zones for oil, gas, and geothermal exploration and development activities where contracts and leases do not already exist. Adjust the operating plans of existing contracts to (A) eliminate negative effects that prevent attainment of bull trout biological needs and (B) avoid adverse effects to bull trout.
5. Prohibit sand and gravel mining and extraction within habitat protection zones.

6. Develop inspection, monitoring, and reporting requirements for mineral mining activities. Evaluate and apply the results of inspection and monitoring to modify mineral plans, leases, or permits as needed to eliminate negative effects that prevent attainment of bull trout biological needs and avoid adverse effects on bull trout.

Fire and Fuels Management

1. Design fuel treatment and fire suppression strategies, practices, and actions so as not to prevent attainment of bull trout biological needs, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management actions could be damaging to long-term ecosystem function, or bull trout biological needs.

2. Use an interdisciplinary team, including a fishery biologist, to identify incident base and helibase locations during pre-suppression planning, with avoidance of potential adverse effects to bull trout as a primary goal. Locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of habitat protection zones. If the only suitable location for such activities is within habitat protection zones, locate there and follow recommendations from a fishery resource advisor. The fishery advisor will prescribe the location, use conditions, and rehabilitation requirements, with avoidance of adverse effects to bull trout as a primary goal.

3. Avoid delivery of chemical retardant, foam, or additive to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist.

4. Design prescribed burn projects and prescriptions to contribute to the attainment of bull trout biological needs.

5. Immediately establish an emergency team to develop a rehabilitation treatment plan to attain bull trout biological needs and avoid adverse effects on bull trout whenever habitat protection zones are substantially damaged by a wildfire or a prescribed fire burning out of prescription.

Federal Public Lands Property Management

1. Require instream flows and habitat conditions for hydroelectric and other surface water development proposals that maintain or restore riparian resources, favorable

channel conditions, and fish passage, reproduction, and growth. Coordinate this process with the appropriate State agencies. During relicensing of hydroelectric projects, provide written and timely license conditions to the Federal Energy Regulatory Commission that require fish passage and flows and habitat conditions that maintain and restore riparian resources and channel integrity. Coordinate relicensing projects with the appropriate State agencies.

2. Locate new hydroelectric ancillary facilities outside habitat protection zones. For existing ancillary facilities inside the habitat protection zones that are essential to proper management, provide recommendations to the Federal Energy Regulatory Commission to assure that the facilities will not prevent attainment of bull trout biological needs and that adverse effects on bull trout are avoided. Where these objectives cannot be met, provide recommendations to the Federal Energy Regulatory Commission that such ancillary facilities should be relocated. Locate, operate, and maintain hydroelectric facilities that must be located in habitat protection zones to avoid effects that would retard or prevent attainment of bull trout biological needs and avoid adverse effects on bull trout.
3. Issue leases, permits, rights-of-way, and easements to avoid effects that would retard or prevent attainment of bull trout biological needs and avoid adverse effects on bull trout. Adjust existing leases, permits, rights-of-way, and easements to eliminate effects that would retard or prevent attainment of bull trout biological needs or adversely affect bull trout. If adjustments are not effective, eliminate the activity. Base priority for modifying existing leases, permits, rights-of-way, and easements on the current and potential adverse effects on bull trout and the ecological value of the riparian resources affected.
4. Use land acquisition, exchange, and conservation easements to meet bull trout biological needs and facilitate restoration of bull trout.

General Riparian Area Management

1. Identify and cooperate with Federal, Tribal, State and local governments to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.
2. Trees felled in habitat protection zones because they pose a safety risk for recreation areas should be kept on site.
3. Apply herbicides in a manner that does not retard or prevent attainment of bull trout biological needs and avoids adverse effects on bull trout. Do not apply insecticides or other toxins in habitat protection zones and avoid application of herbicides within

habitat protection zones whenever possible. Avoid the introduction of any herbicide, insecticide, or other toxins into waterways.

4. Prohibit storage of fuels and other toxins within habitat protection zones. Prohibit refueling within habitat protection zones.
5. Locate water drafting sites to avoid adverse effects to bull trout and instream flows, and in a manner that does not retard or prevent attainment of bull trout biological needs.

Watershed and Habitat Restoration

1. Design and implement watershed restoration projects in a manner that promotes the long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and contributes to attainment of bull trout biological needs.
2. Cooperate with Federal, State, local, and Tribal agencies, and private landowners to develop watershed resource management plans or other cooperative agreements to meet bull trout biological needs.
3. Do not use planned restoration as a substitute for preventing habitat degradation (*i.e.*, use planned restoration only to mitigate existing problems not to mitigate the effects of proposed activities).

Fisheries and Wildlife Restoration

1. Design and implement fish and wildlife habitat restoration and enhance actions in a manner that contributes to attainment of bull trout biological needs.
2. Design, construct, and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of bull trout biological needs or adversely affect bull trout. For existing fish and wildlife interpretive and other user-enhancement facilities inside habitat protection zones assure that bull trout biological needs are met and adverse effects on bull trout are avoided. Where bull trout biological needs cannot be met or adverse effects on bull trout avoided, relocate or close such facilities.
3. Cooperate with Federal, Tribal, and State fish management agencies to identify and eliminate adverse effects on bull trout associated with habitat manipulation, fish stocking, fish harvest, and poaching.

4. Conduct watershed analysis and subbasin analysis and use results to design management plans and actions.

Subbasin analysis and watershed analysis are systematic procedures for determining how subbasins and watersheds function in relation to physical and biological components. This is accomplished through consideration of history, processes, landform, and condition. Watershed analysis should follow the final guidance on "Ecosystem Analysis at a Watershed Scale, Federal Guide for Watershed Analysis" (often referred to as the "Federal Guide"; USDA *et al.* 1995). Currently there are two memoranda available (dated November 1, 1995 and October 16, 1996) that include new information and modules to be used. In addition, there is a draft riparian module (February 1997) specific to intermittent streams.

Watershed analysis is a prerequisite for determining which processes and parts of the landscape affect fish and riparian habitat, and is essential for defining watershed-specific boundaries for habitat protection zones and for bull trout biological needs. Watershed analysis can form the basis for evaluating cumulative watershed effects; defining watershed restoration needs, goals, and objectives; implementing restoration strategies; and monitoring the effectiveness of watershed protection measures, depending upon the issues to be addressed in the watershed analysis.

5. Use implementation and effectiveness monitoring to determine if:

- a) Actions on federally managed lands implemented recovery tasks or followed the Project Designs for Bull Trout Conservation; and
- b) Recovery tasks or Project Designs for Bull Trout Conservation successfully protect and contribute to the recovery of bull trout.

The recovery plan describes the need for monitoring. Monitoring is necessary to determine the effectiveness of recovery tasks and Project Designs for Bull Trout Conservation. If degradation continues after recovery tasks or Project Designs for Bull Trout Conservation are implemented, then we could conclude they are not effective in bringing about recovery, and make changes to increase the chances for recovery. Many different monitoring strategies have been developed over the years. Strategies developed in the recovery plan and in the Monitoring Modules resulting from the Interagency Implementation Team for the Biological Opinion on PACFISH and INFISH should continue to be used and new modules developed for implementation and effectiveness monitoring.

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